**Lens Problems – Converging Lenses**

1. An object 8.00 cm high is placed 80.0 cm in front of a converging lens of focal length 25.0 cm. Determine the image position and its height.
2. A typical single lens reflex (SLR) camera has a converging lens with a focal length of 50.0 mm. What is the position and size of the image of a 25.0 cm candle located 1.00 m from the lens.
3. A converging lens with a focal length of 20.0 cm is used to create an image of the sun on a paper screen. How far from the lens must the paper be placed to produce a clear image?
4. The focal length of a slide projector’s converging lens is 10.0 cm.
   1. If a 35.0 mm slide is positioned 10.2 cm from the lens, how far away must the screen be placed to create a clear image?
   2. If the height of a dog on the slide film is 12.5 mm, how tall will the dog’s image on the screen be?
5. Locate the position of the image of a candle 10.0 cm high, placed 20.0 cm in front of a converging lens of focal length 25.0 cm.
6. An object 5.0 cm high is placed at the 20.0 cm mark on a metre stick optical bench. A converging lens with a focal length of 20.0 cm is mounted at the 50.0 cm mark. What is the position and size of the image?
7. A camera lens (converging lens) has a focal length of 6.0 cm and is located 7.0 cm from the film. How far from the lens is the object positioned if a clear image is produced on the film?
8. A converging lens with a focal length of 20.0 cm is held 12.0 cm from a grasshopper 7.0 mm high. What is the size of the image of the grasshopper? State its position and type.
9. A projector is required to make a real image, 0.50 m tall, of a 5.0 cm object placed on a slide. Within the projector, the object is to be placed 10.0 cm from the lens. What must be the focal length of the lens?
10. A 3.0 cm flower is placed 40.0 cm from a converging lens with a focal length of 10.0 cm. What is the position, size and type of the image?

**Lens Problems – Diverging Lenses**

1. Find the height of the image of a candle 5.0 cm tall situated at the following positions in front of a diverging lens of focal length 15.0 cm:
   1. 30.0 cm
   2. 25.0 cm
   3. 15.0 cm
   4. 10.0 cm
2. A person has a diverging lens with the following focal lengths: 5.0 cm, 20.0 cm, 50.0 cm. If she places an object 5.0 cm tall, 25.0 cm from each lens, determine the height of the image and the magnification of each lens.
3. A lens has a magnification of -0.5. If the focal length of the lens is -20.0 cm, find:
   1. The object position
   2. The image position
   3. What type of lens is it?